

What is claimed is:

1. In a radio receiver for use in a radio communication network, an improvement of a receiver for receiving a radio signal from a transmitter that employs transmit diversity, said receiver comprising:
 - a first stage comprising an STTD-RAKE receiver for receiving and processing the transmitted signal and for producing an estimation of the transmitted signal as an output;
 - a second stage for receiving the output of the first stage and processing it to further refine the estimation using parallel interference cancellation (STTD-PIC); and
 - a third stage for receiving the output of the second stage and processing it to further refine the estimation using STTD-PIC;wherein at least one of the second stage and the third stage comprises an STTD-linear minimum mean square error (LMMSE) receiver.
2. The radio receiver of claim 1, wherein the receiver is operable according to a code division multiple access (CDMA) standard.
3. The radio receiver of claim 1, wherein the second stage comprises an STTD-LMMSE receiver.
4. The radio receiver of claim 1, wherein the third stage comprises an STTD-LMMSE receiver.

5. The radio receiver of claim 1, wherein each stage comprising an STTD-PIC further comprises an LMMSE receiver.

6. The radio receiver of claim 1, further comprising at least one stage that is subsequent to the third stage for receiving the output of the stage preceding it and processing it to further refine the estimation.

7. The radio receiver of claim 1, wherein the receiver also receives a pilot signal, wherein the second stage produces a refined estimation of the pilot signal.

8. The radio receiver of claim 7, wherein a plurality of stages that are subsequent to the first stage also each receive a pilot signal, and produce a further refined estimation of the pilot signal.

9. A system for wireless communication using STTD, said system comprising:
- a transmitter operable for transmitting signals using STTD;
 - a receiver for receiving the transmitted signals, wherein the receiver comprises:
 - a first stage comprising a RAKE-STTD for processing the received signal to produce an output; and
 - a second stage comprising an STTD-PIC and an STTD-LMMSE for receiving the output of the first stage and processing it to produce an output.
10. The system of claim 9, further comprising an STTD-PIC third stage for receiving the output of the second stage and further processing it.
11. The system of claim 10, wherein the third stage further comprises an STTD-LMMSE.
12. The system of claim 9, wherein the second stage also receives the transmitted signals.
13. The system according to claim 9, wherein the system employs 2-1 diversity.

14. A method for processing a received STTD radio signal carrying transmitted data, said method comprising the steps of:

- receiving indications of the received radio signal in a first stage RAKE-STTD;
- processing the signal in the first stage to produce an estimate of the data as output;
- receiving as input in a second stage of the receiver the output of the first stage;

and

- processing the input received in the second stage to produce a refined estimate of the data as output;

wherein the second stage comprises an STTD-PIC and an STTD-LMMSE.

15. The method of claim 14, further comprising the steps of:

- receiving as input in a third stage of the receiver the output of the second stage;

and

- processing the input received in the third stage to produce a refined estimate of the data as output.

16. The method of claim 14, wherein the second stage also receives and processes the radio signal.

17. The method of claim 16, wherein the third stage also receives and processes the radio signal.